Appendix A

In the Title

Please amend the title to read as follows EXTERNAL I/O AND COMMUNICATIONS INTERFACE FOR A REVENUE METER—

In the Abstract

Please replace the text of the existing abstract with the following text:

A revenue meter includes electronics for measuring the delivery of electrical energy from an energy supplier to a consumer through an electric circuit. An interface link connects to the revenue meter. An I/O and communications device connects through the interface link to the revenue meter. The I/O and communications device may also connect to a second electric circuit. [An I/O and communications device connects the interface link to the electric circuit.] The I/O and communications device uses a serial interface to communicate with the revenue meter. The I/O and communications device provides one or more of analog inputs and outputs, digital inputs and outputs, and communications ports.

In the Specification:

On page 1, in the Cross Reference to Related Applications section:

The following co-pending and commonly assigned U.S. patent applications have been filed on the same date as the present application. All of these applications relate to and further describe other aspects of the embodiments disclosed in the present application and are all herein incorporated by reference.

[U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/370,317, "REVENUE METER WITH POWER QUALITY FEATURES", (Attorney Ref. No. 06270/22), [filed _____] filed August 9, 1999.

[U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/371,883, "A-BASE REVENUE METER WITH POWER QUALITY FEATURES", (Attorney Ref. No. 06270/32), [filed _____] filed August 9, 1999.

[U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/370,695, "REVENUE METER WITH GRAPHIC USER INTERFACE", (Attorney Ref. No. 06270/23), [filed _____] filed August 9, 1999.

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[U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/370,686, "REVENUE METER BLADE ASSEMBLY AND METHOD OF ATTACHMENT", (Attorney Ref. No. 06270/25), [filed _____] filed August 9, 1999, and issued as U.S. Patent No. 6,186,842 on February 13, 2001.

[U.S. Pat. Application Ser. No. _____] [U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/370,863, "A POWER SYSTEM TIME SYNCHRONIZATION DEVICE AND METHOD FOR SEQUENCE OF EVENT RECORDING", (Attorney Ref. No. 06270/24), [filed _____] filed August 9, 1999.

[U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/369,870, "METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLED GAIN SWITCHING OF POWER MONITORS", (Attorney Ref. No. 06270/27), [filed _____] filed August 9, 1999.

[U.S. Pat. Application Ser. No. _____] U.S. Pat. Application Ser. No. 09/370,757, "A KEYPAD FOR A REVENUE METER", (Attorney Ref. No. 06270/34), [filed _____] filed August 9, 1999.

On page 3, line 3 to line 8:

To provide user input to the revenue meter, known meters typically utilize cumbersome keys or buttons located within a sealed cover of the revenue meter, or keys which are accessible [form] from the outside but are sealed and cannot be activated without removing the seal. In both cases, at least one security seal is installed to prevent or indicate unauthorized access. Thus, the seal must be replaced [very] every time the meter is accessed.

On page 5, line 1 to line 9:

Thus, there is a need for an improved revenue meter that provides easily accessible and easy to use interfaces. This includes both a front panel, as well as I/O and communications connections. In addition, there is a need for an improved revenue meter with an I/O and communications interface that is located separate from the revenue meter. In addition, there is a need for an [extern al] external I/O device that is easy for the user to configure, hence reducing installation time. Moreover, there is a need for an I/O and communications interface that is expandable and not limited to the number of conductors leaving the revenue meter.

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On page 10, line 5 to line 14:

Referring to FIGS. 1-3, the S-base and A-base revenue meters' cover 24, and the Switchboard revenue meter's cover 48, are at least partially transparent. The transparency permits viewing of the meter's display 28 including a graphic user interface (GUI)(not shown) without having to remove the cover 24. As mentioned above, the meter cover 24 provides the context adaptable input device such as the keypad 32 for interacting with the revenue meter while the meter cover 24, 48 remains in place. Artisans will appreciate that the keypad 32 can be replaced with other context adaptable input devices, such as a touch screen, a mouse, a track ball, a light pen, a membrane switch, or other similar [device] devices.

On page 10, line 23 to line 30:

The keypad 32 presents information (i.e., the state of the input hardware such as buttons) or messages to a microprocessor, microcontroller or other central control device via the GUI, which in turn performs actions depending on the type of input and the current operating mode of the revenue meter 20, 34, 42. The GUI and a description of the operating modes is discussed in commonly owned [U.S. Pat. Application Ser. No. _____, "REVENUE METER WITH GRAPHIC USER INTERFACE", filed _____, which is incorporated by reference herein] U.S. Pat. Application Ser. No. 09/370,695, "REVENUE METER WITH GRAPHIC USER INTERFACE" which was incorporated by reference above.

On page 12, line 23 to line 31:

Referring to FIGS. 4B and 5A-5C, to provide a watertight interface between the keypad 32 and the cover 24, a backside of the top portion 33 of the cover 24 includes sealing walls 58. Infrared light pipes 59 are also included on the backside of the top portion 33 of the cover 24. As described, the keypad 32 of the revenue meter 20, 34, 42 utilizes an elastomer keypad. The sealing walls 58 [sealing] sealingly engage the elastomer keypad 32. The keypad 32 includes at least one button, e.g., scroll buttons 52, with a plunger 64, and a web 66 portion which allows the plunger to move in a direction generally perpendicular to the keypad 32.

On page 13, line 17 to line 26:

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Referring to FIGS. 6A and 6B, to mechanically connect the keypad 32 to the revenue meter 26, intermediate actuators 72 transfer the keypad's motion to micro switches 74 mounted on a printed circuit board 76. Referring also to FIGS. 7A-7D, according to a preferred embodiment, the intermediate actuators 72 are contained within bezel 78. The intermediate actuators 72 include intermediate key actuators 72a, an intermediate reset demand actuator 72b, and an intermediate test mode actuator 72c which is accessible only when the cover 24 is removed. Thus, unlike known demand reset keys which [includes] include multiple parts, including a spring, fasteners and lever arms, the bezel 78 of the present invention allows for a one piece demand reset key.

On page 16, line 24 to line 31:

The first external I/O and communications device 88 is the master on the bus, and thus initiates all data transfers. In a preferred embodiment, the interface is [a] full-duplex, therefore data flows in both directions at once. The I/O and communications device 88 reports its input states while the revenue meter 20 transmits output states. Preferably, all data packets are error checked using a cyclic redundancy check. If a transmission error is detected, no retry is attempted, the packet is ignored and the states are updated on the next transaction.

On page 19, line 12 to line 13:

Type X – 16 bits indicating the type of input or output of a [particulr] particular port on the I/O and communications device 88. For example:

On page 21, line 12 to line 26:

It is necessary to timestamp the transition time of an input on the external I/O device 88 based on the time in the revenue meter 20, 34, 42 since the microprocessors in the revenue meter and external I/O and communications device are not time synchronized[,]. The external I/O and communications device 88 preferably scans inputs every 819.2 microseconds. When the I/O and communications device 88 sees a transition on an input, it stores the free running counter in the input packet. This free running counter ideally increments every 3.2 microseconds. When the external I/O device is transmitting the input packet to the meter, just before transmitting the last four bytes of the packet, for example, it inserts the current free running counter into the 3rd and 4th last bytes. This ensures that the free running counter value inserted into the

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packet is as close as possible to the value it would be at the end of packet transmission. When the revenue meter 20, 34, 42 receives the packet, it calculates the time of transition of any of the inputs with the following formula:

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